

# Bel-Halo

LED DENTAL LIGHT

**MODEL**

**AL-901 Unit Mount**

**AL-902 Ceiling Mount**

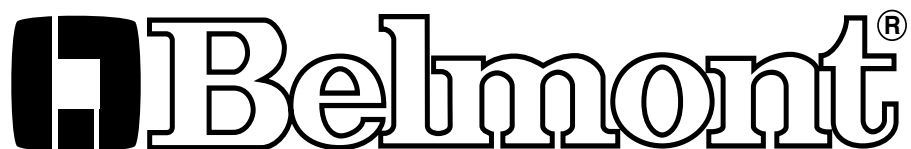
**AL-905 Track Mount**

**AL-920X Swing Mount**

## INSTALLATION and OPERATION INSTRUCTIONS

**⚠ IMPORTANT**

After installation is completed, check all the bolts, screws and fasteners to confirm that they are securely fastened.





### Intended Use of the Product

This product is intended for the exclusive use for diagnoses, treatments and relative procedures of dentistry, and must be operated or handled by the qualified dentists or by dental staffs under the supervision of the dentist. Such dentists or dental staffs should instruct and/or assist the patients to approach to and leave from the product. Patients should not be allowed to operate or handle the product unless he/she is so instructed.

### WARNING

Operation of a dental light under Electro Magnetic Interferences.

This equipment may malfunction by electromagnetic interferences.



Do not install dental light close to the equipment that generates electromagnetic interference (i.e. communication equipment, elevator)

Do not use the device that creates interference (i.e. cellular phone) near this equipment.

Do not use electric surgical knife or laser knife with dental light.

Light may turns on/off by itself due to malfunction of a sensor caused by electromagnetic interferences.

### Symbols

|   |  |   |              |
|---|--|---|--------------|
|  | Caution<br>It means "caution, warnings, or possibility to danger". |  | Manufacturer |
|---|--|---|--------------|

### Environmental condition for Operation

Temperature : 41~104F (5 ~ 40°C)

Humidity : 10 ~ 80%

Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

### Environmental condition for Storage

Temperature : -4~158F (-20 ~ 70°C)

Humidity : 10 ~ 80%

Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

### Environmental condition for Transportation

Temperature : -4~158F (-20 ~ 70°C)

Humidity : 10 ~ 80%

Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

**⚠️ WARNING**

- To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.
- Position a light head by holding light handle(s).
- Installation and service work should be conducted by an authorized installation/service personnel only.

**⚠️ WARNING: The followings are prohibited.**

- To modify this equipment.
- To use the equipment under any failure condition.
- To use the equipment without doing the daily and periodical check-up.
- To wipe the plastic covers with any disinfectant or detergent that contains organic solvent.

**Precautions for Installation**

- Assure that the ceiling and/or framing can provide the 70 lb. (31.5kg) of dead weight capacity and the additional force of movement and positioning of the light.
- Keep the equipment away from water.
- Keep in circumstances safe from influence by temperature, humidity, wind, sun light, air containing salts and minerals.
- Care about stability such as inclination, vibration and impact, including handling and transportation.
- Do not keep the equipment in a place where chemicals are or where gas is emitted.
- During lifting and unpacking of the light, make sure to hold only the designated parts.
- Do not drop or hit the light.
- Do not connect to power supply other than AC120V 60HZ.
- Ground light properly prior to turning power on.
- When the installation process has been completed, verify that all the mechanical and electrical functions are working properly.
- Thick gloves are highly recommended at unpacking.
- Do not modify this equipment.

## CAUTION

### Before use

- Check connection of switches and make sure that the device functions properly.
- Make sure that grounding wire is connected.
- Make sure that cables are properly and perfectly connected.

### During use

- Do not use the light longer than required for examination or treatment.
- Always watch the patient and the equipment to make sure nothing is wrong.
- If anything wrong is observed with the equipment or the patient, take a proper action, such as stopping the use of equipment as well as keeping the patient in safe.
- Keep an eye on the patient not to touch the equipment.

### After use

- Turn off the light.
- Clean the equipment and get it ready for use.

## CAUTION

Do not spray liquids directly onto light surfaces.

In order to prevent damage to electrical components and systems, do not apply excess cleaning solution onto light surfaces.

## NOTE

Warranty does not cover damage to equipment caused by disinfectant solutions

## [1] SPECIFICATIONS

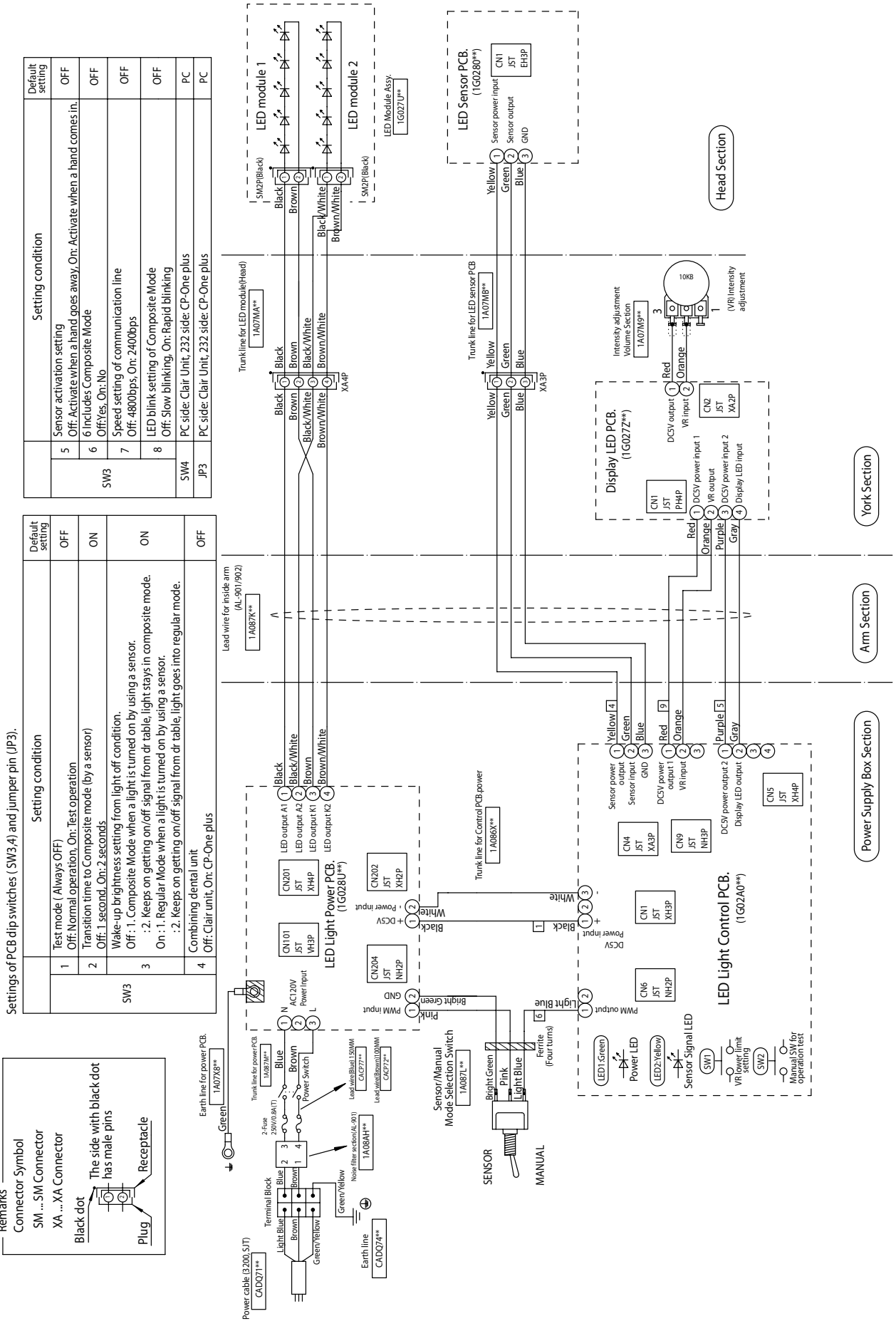
1. Focal Distance..... 25.6" (650 mm)
2. Color Temperature ..... 5000° Kelvin
3. Light Intensity  
Regular Operation Mode ..... 4000 Lux / 370 FTC ~ 32000 Lux / 3970 FTC  
Composite Mode ..... 5500 Lux / 510 FTC
4. Light Pattern..... 3.2" x 5.5" at 25.6"
5. Power Requirement..... AC. 120V / 60 Hz / 0.43A

## [2] CLASSIFICATION

- a. Protection against electric shock : Class I Equipment.
- b. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

# [3] WIRING DIAGRAM

## 3-1. Unit Mount (AL-901) & Ceiling Mount (AL-902)

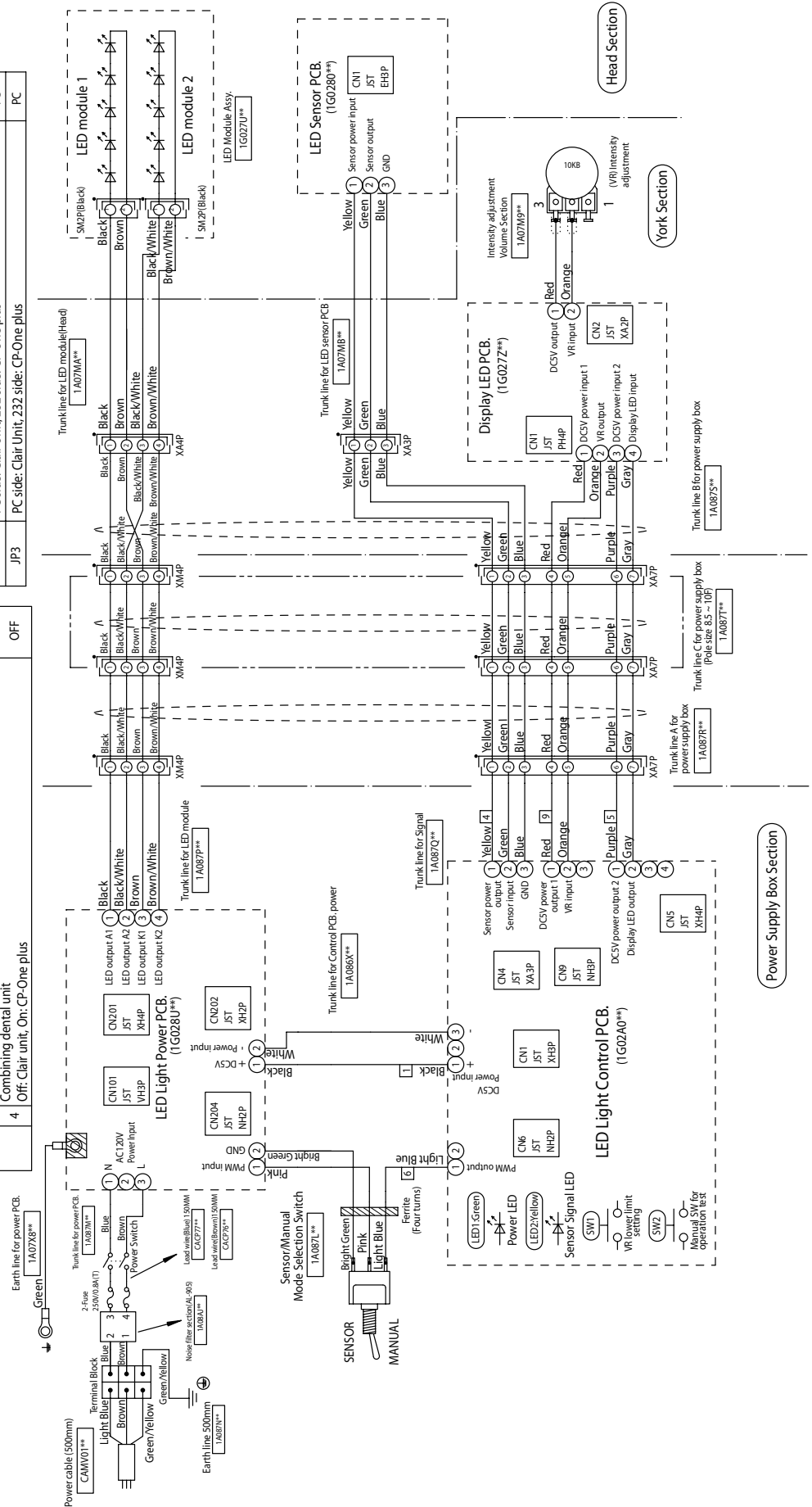
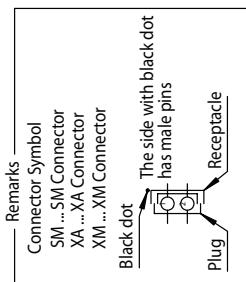


### 3-2. Track Mount (AL-905)

Settings of PCB dip switches (SW3,4) and jumper pin (JP3).

| Setting condition |  | Default setting |
|-------------------|--|-----------------|
| 5                 | Sensor activation setting<br>Off: Activate when a hand goes away, On: Activate when a hand comes in. | OFF             |
| 6                 | Includes Composite Mode<br>Off: Yes, On: No  | OFF             |
| 7                 | Speed setting of communication line<br>Off: 4800bps, On: 2400bps                                     | OFF             |
| 8                 | LED blink setting of Composite Mode<br>Off: Slow blinking, On: Rapid blinking                        | OFF             |
| SW4               | PC side: Clair Unit, 232 side: CP-One plus   | PC              |
| JP3               | PC side: Clair Unit, 232 side: CP-One plus   | PC              |

| Setting condition |  | Default setting |
|-------------------|--|-----------------|
| 1                 | Test mode (Always OFF)<br>Off: Normal operation, On: Test operation  | OFF             |
| 2                 | Transition time to Composite mode (by a sensor)<br>Off: 1 second, On: 2 seconds  | ON              |
| 3                 | Wake-up brightness setting from light off condition.<br>Off: 1. Composite Mode when a light is turned on by using a sensor.<br>: 2. Keeps on getting on/off signal from dr. table, light stays in composite mode.<br>On: 1. Regular Mode when a light is turned on by using a sensor.<br>: 2. Keeps on getting on/off signal from dr. table, light goes into regular mode. | ON              |
| 4                 | Combining dental unit<br>Off: Clair unit, On: CP-One plus  | OFF             |

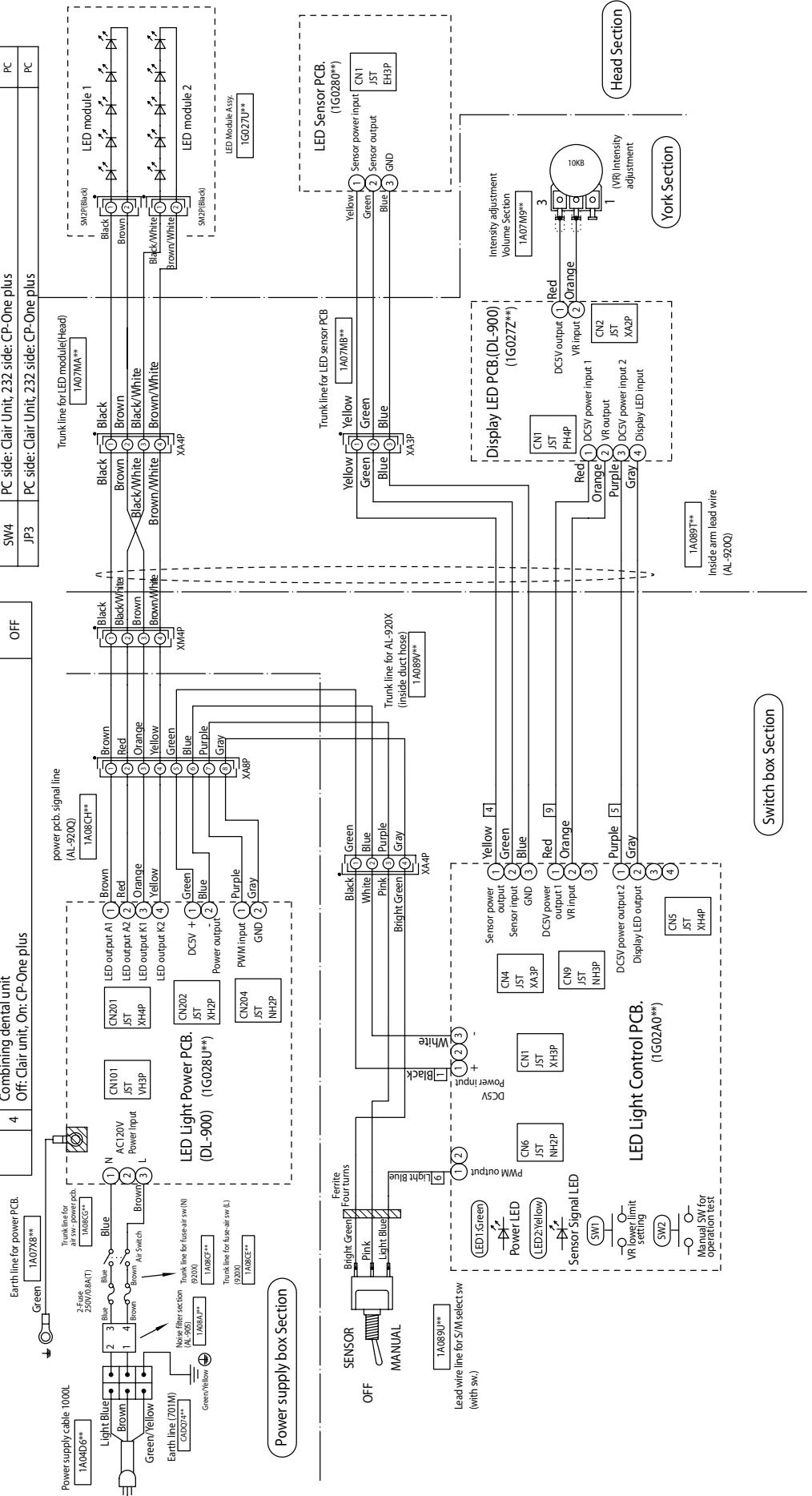
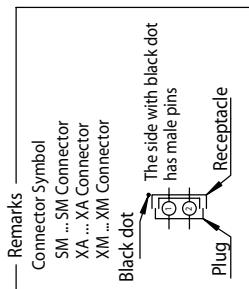


### 3-3. Swing Mount (AL-920X)

Settings of PCB dip switches (SW3,4) and jumper pin (JP3).

| Setting condition |  | Default setting |
|-------------------|--|-----------------|
| 1                 | Test mode (Always OFF)<br>Off: Normal operation, On: Test operation  | OFF             |
| 2                 | Transition time to Composite mode (by a sensor)<br>Off: 1 second, On: 2 seconds  | ON              |
| SW3               | Wake-up brightness setting from light off condition.<br>Off: 1. Composite Mode when a light is turned on by using a sensor.<br>:2. Keeps on getting on/off signal from dr table, light stays in composite mode.<br>On: 1. Regular Mode when a light is turned on by using a sensor.<br>:2. Keeps on getting on/off signal from dr table, light goes into regular mode. | ON              |
| 4                 | Combining dental unit<br>Off: Clair unit, On: CP-One plus  | OFF             |

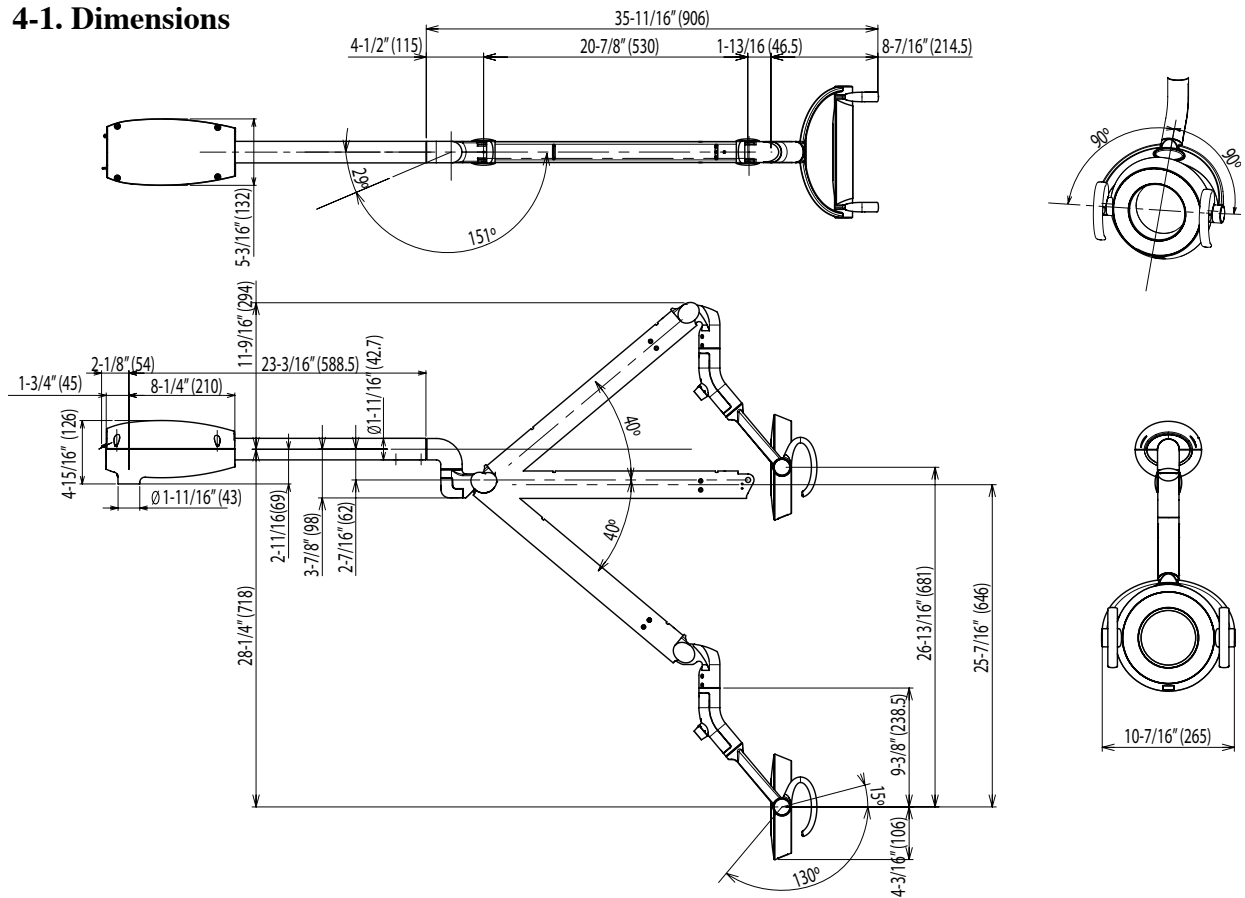
| Setting condition |  | Default setting |
|-------------------|--|-----------------|
| 5                 | Sensor activation setting<br>Off: Activate when a hand goes away, On: Activate when a hand comes in. | OFF             |
| 6                 | Includes Composite Mode<br>Off: Yes, On: No  | OFF             |
| 7                 | Speed setting of communication line<br>Off: 4800bps, On: 2400bps                                     | OFF             |
| 8                 | LED blink setting of Composite Mode<br>Off: Slow blinking, On: Rapid blinking                        | OFF             |
| SW4               | PC side: Clair Unit, 232 side: CP-One plus   | PC              |
| JP3               | PC side: Clair Unit, 232 side: CP-One plus   | PC              |



# INSTALLATION INSTRUCTIONS

## [4] UNIT MOUNT TYPE (AL-901)

### 4-1. Dimensions

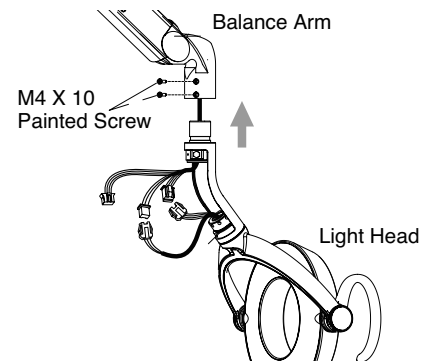


### 4-2. Installation Instructions

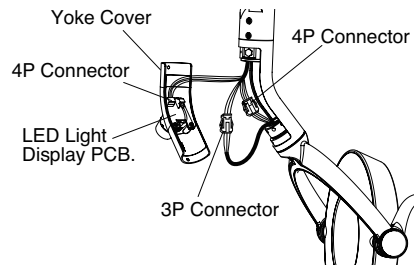
\* All necessary parts are included in the box.

- M3 x 6 Painted Screw ..... 2pcs.
- M4 x 10 Painted Screw ..... 2pcs.
- Yoke Cover..... 1pc.

1) Install the light head to the balance arm with M4 x 10 painted screws.

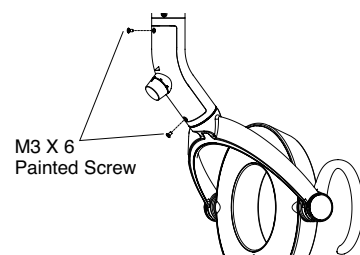


2) Connect the wire harness  
 3P connector : yellow / green / blue  
 4P connector : black / black & white / brown / brown & white  
 Same color to be met at each side of connector



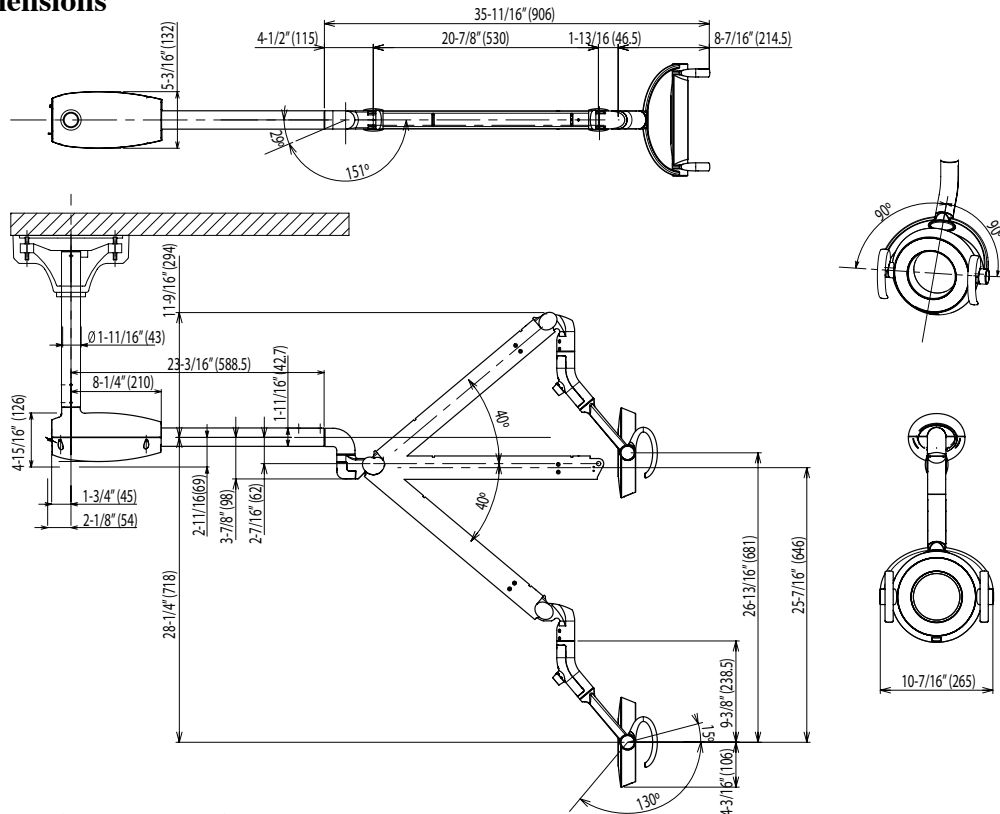
4P connector : red / orange / purple / gray  
 connec to LED Light display PCB of yoke cover.

3) Attach the yoke cover with M3 x 6 painted screws.



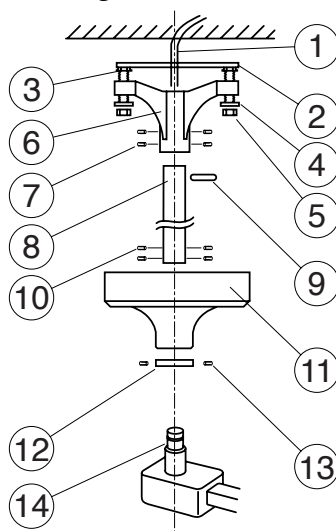
## [5] CEILING MOUNT TYPE (AL-902)

### 5-1. Dimensions



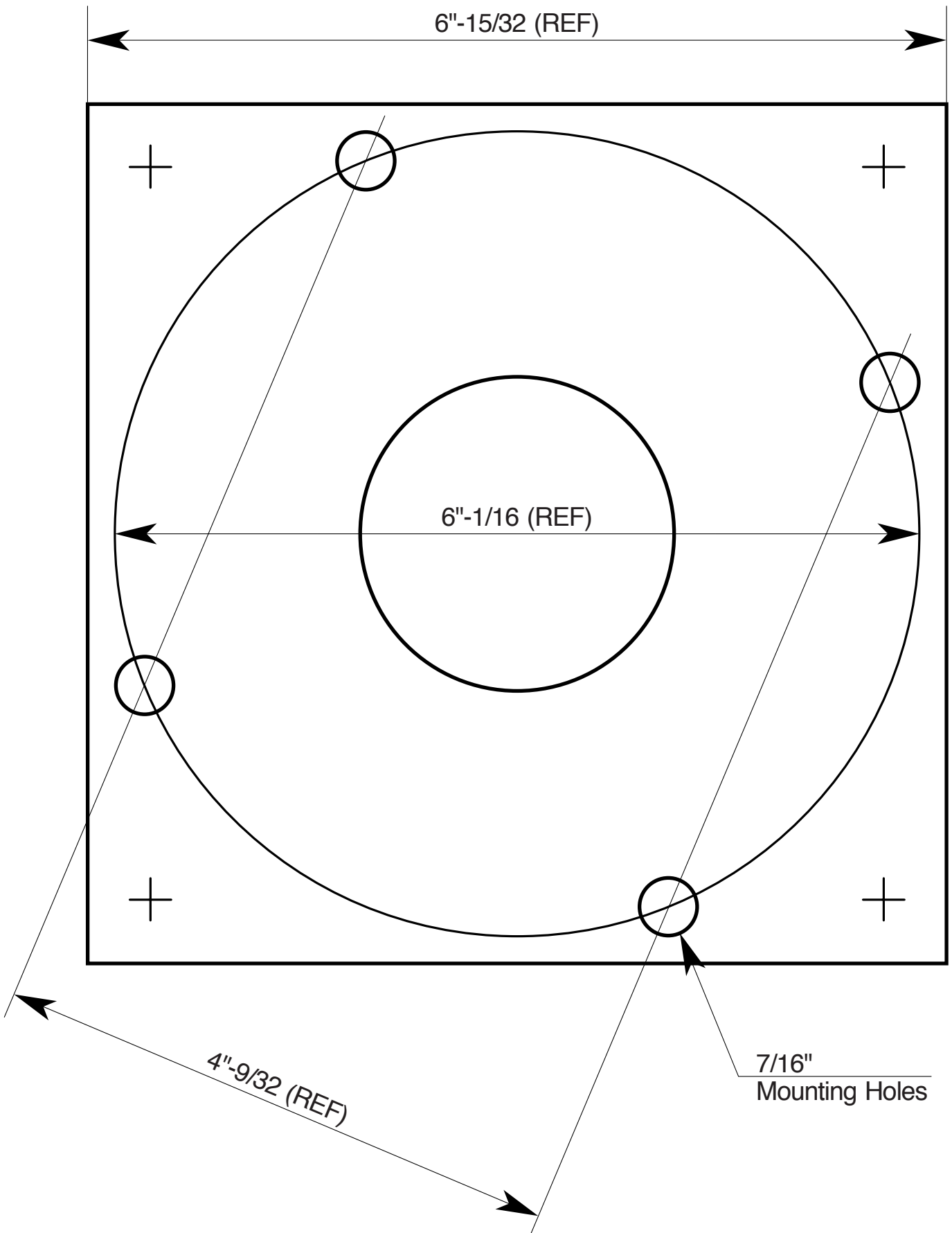
### 5-2. Installation Instructions

- 1) Secure mounting plate to the ceiling.
- 2) Route the power supply through the center of the mounting plate.
- 3) Install the leveling nuts between the mounting plate and the ceiling flange.
- 4) Install the ceiling flange to the mounting plate with washers and nuts supplied.
- 5) Insert the suspension tube into the ceiling flange and secure it with roll pin and set screws supplied.
- 6) Be sure the suspension tube is plumb.
- 7) Slide the flange cover and flange cover ring (flat side up) over the suspension tube and secure them about half way up the tube. Use only one set screw as you will be moving this on final installation.
- 8) Install the light assembly to the suspension tube running the 3 wire cord up through the tube to the ceiling flange. Secure it with 4 Allen set screws.
- 9) Connect the incoming power to the 3 wire cord from the light assembly. Be sure to follow the local electrical codes.
- 10) Test the light for proper operation.
- 11) Reposition the flange cover and secure it with the flange cover ring - Secure all set screws.



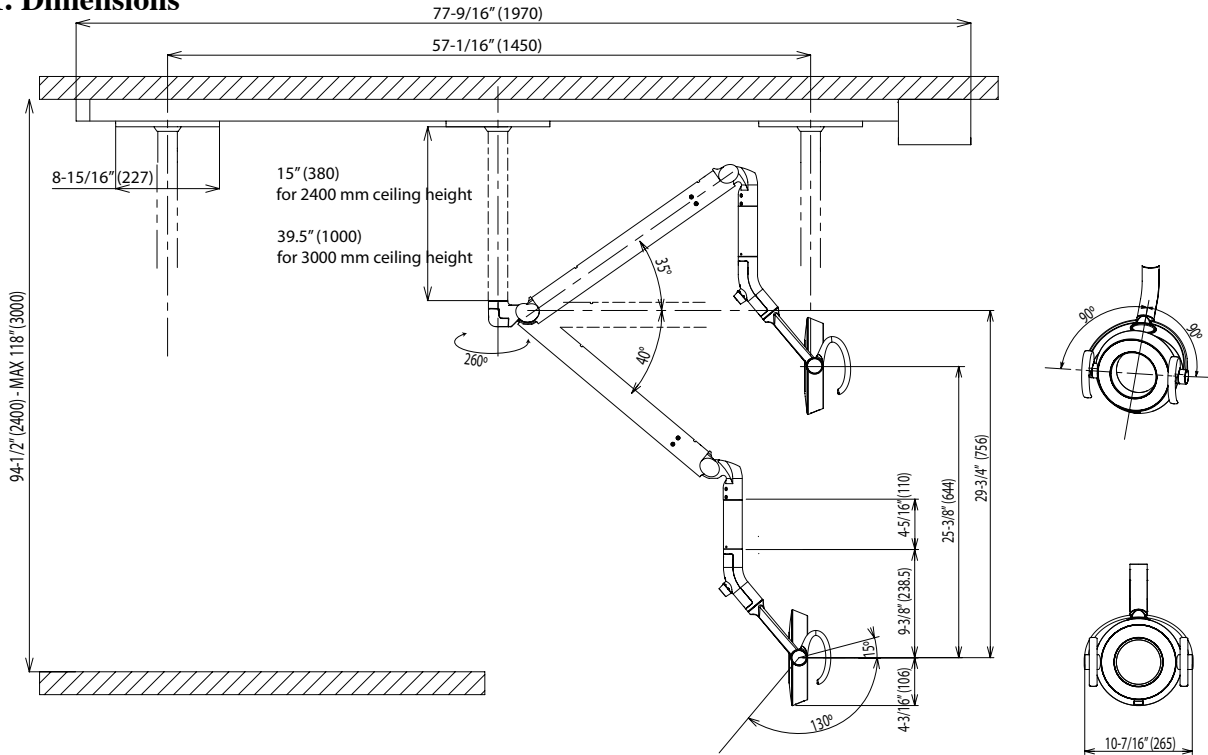
- (1) Power Supply Cable
- (2) Mounting Plate
- (3) Leveling Nut
- (4) Washer
- (5) Nut
- (6) Ceiling Flange
- (7) Socket Screw for Flange
- (8) Suspension Tube
- (9) Roll Pin
- (10) Socket Screw for Arm
- (11) Flange Cover
- (12) Cover Ring
- (13) Socket Screw for Ring
- (14) Suspension Tube of Arm

# FULL-SIZE MOUNTING TEMPLATE



## [6] TRACK MOUNT LIGHT (AL-905)

### 6-1. Dimensions



### 6-2. Ceiling Preparation

For safety in operation as well as stability of the light source, the importance of proper ceiling structure cannot be overemphasized. In general, a ceiling structure capable of supporting 200 lb. dead weight is required.

- A) In conventional ceilings with **joists perpendicular** to the center line of the light, attach the pallet by **at least 6 - 5/16 x 3"** lag screws. Suitable holes are provided in pallet for most installations, utilizing 16" or 12" cc ceiling joists. For other spacings or locations, additional holes can be cut in pallet. (SEE FIGURE 1.)

**IMPORTANT:** Locate transformer end of track at headrest end of chair. - **Not** legrest.

- B) For conventional ceilings with **joists parallel** to the center line of the light, cross blocks must be installed in 3 places to allow mounting with **at least 6 - 5/16 x 3"** lag screws. (SEE FIGURE 2.)
- C) For suspended ceilings, appropriate rigid structure must be attached to the ceiling framework to provide 200 lb. dead weight capacity. (SEE FIGURE 3.)

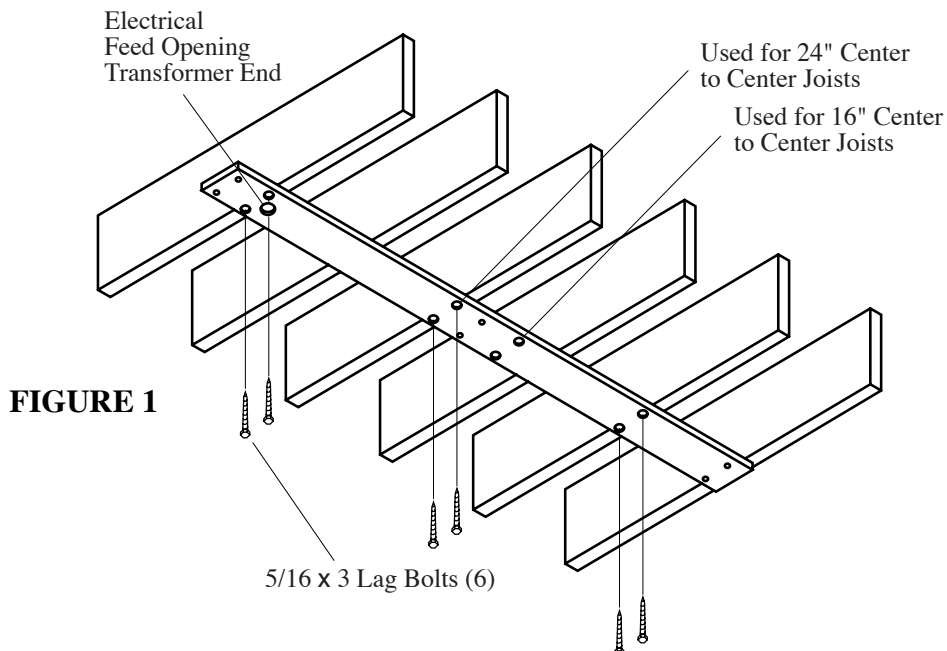
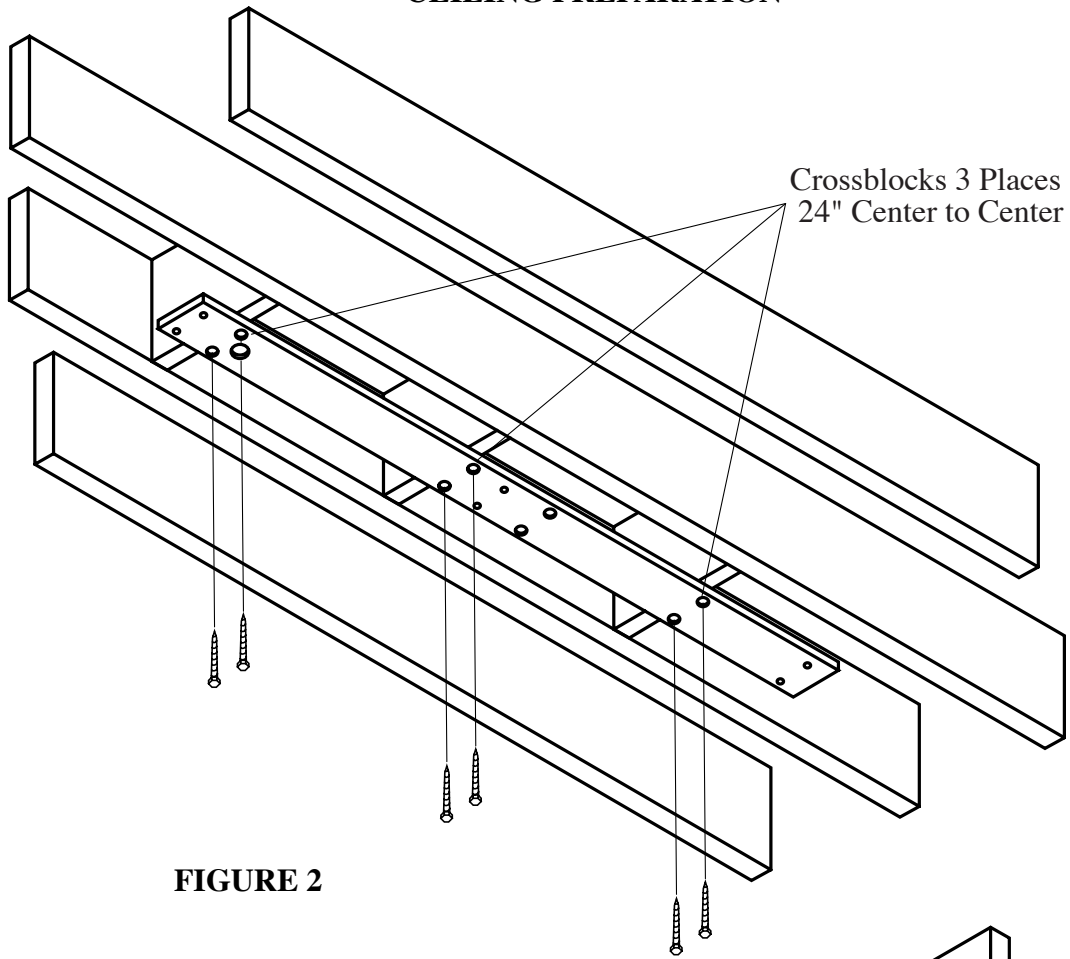
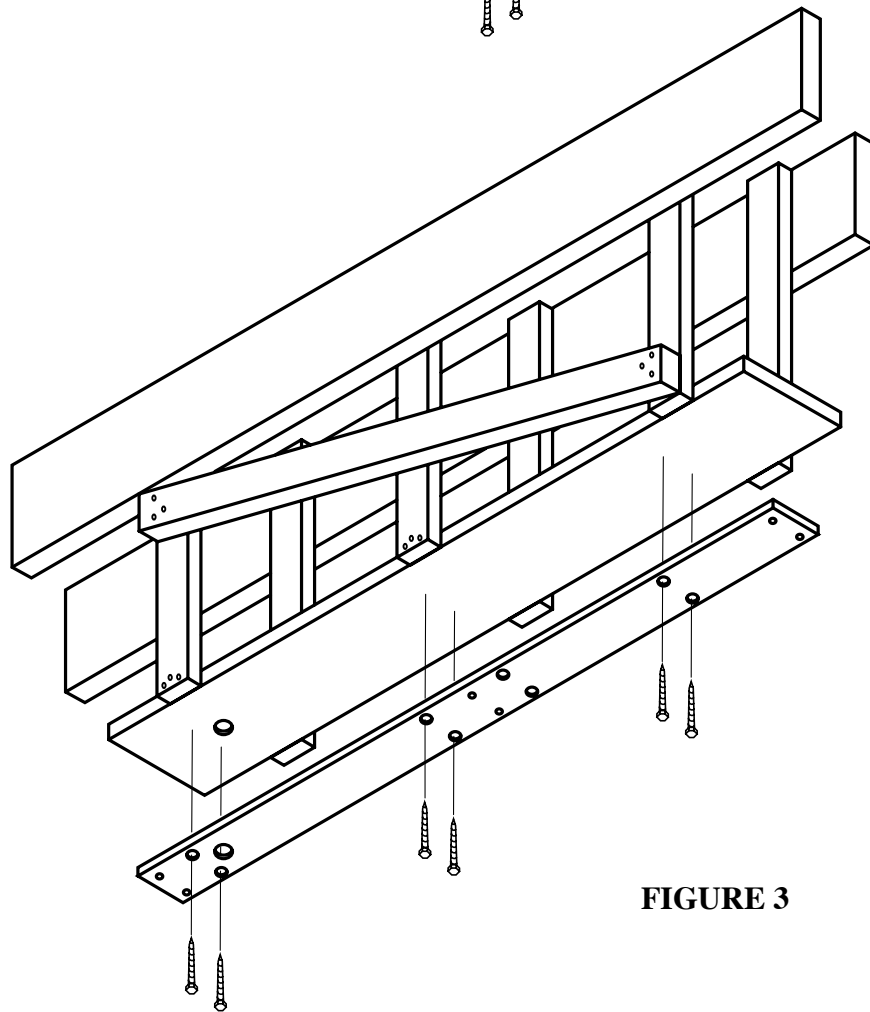


FIGURE 1

# CEILING PREPARATION



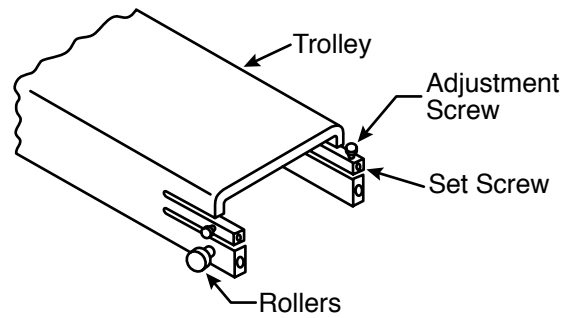
**FIGURE 2**



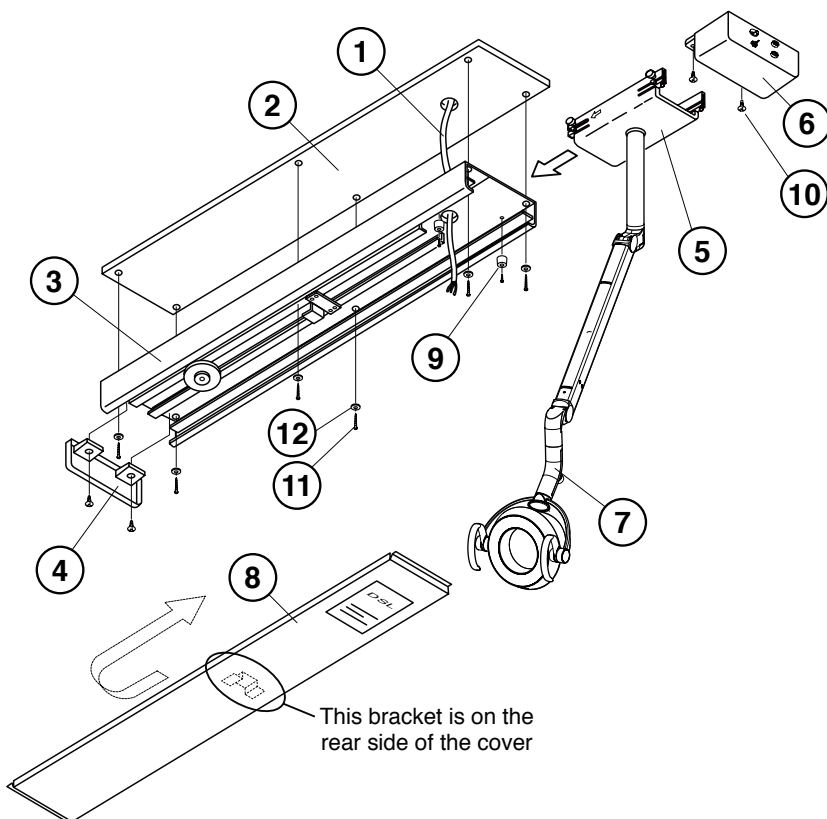
**FIGURE 3**



11) Check operation of the trolley. It is factory adjusted to provide smooth effortless travel, without play; however rollers can be readjusted if necessary. Loosen the set screw and adjust the socket cap screw to vary roller clearance.



- 12) Unpack the transformer / housing assembly and mount it to the track with screws provided.
- 13) Attach the pigtail leads to the corresponding power line wires at the terminal block. Retain the wires under the plastic clip.
- 14) Connect the plug-in connector to the trolley wire.
- 15) Carefully slide bottom cover onto the track from free end. Be sure to engage lip onto Z bracket.
- 16) Install the end-cap with the screws provided.
- 17) Slide the trolley back and forth, checking for binding or rubbing.
- 18) Confirm that the swing arm is properly adjusted to stay where it is placed. If necessary, move the head up or down to expose the appropriate cross drilled nut and adjust with the tool provided.
- 19) Turn on power and check electrical operation of the light.



- (1) Power supply cable
- (2) Pallet
- (3) Track
- (4) End-cup
- (5) Trolley
- (6) Power Supply Box
- (7) Light Assembly
- (8) Bottom Cover
- (9) Rubber bumper
- (10) Screw with plain washer & spring washer M4x15(2 pcs)
- (11) Hex Head Bolt M8x25(6 pcs)
- (12) Spring Washer M8 (6 pcs)

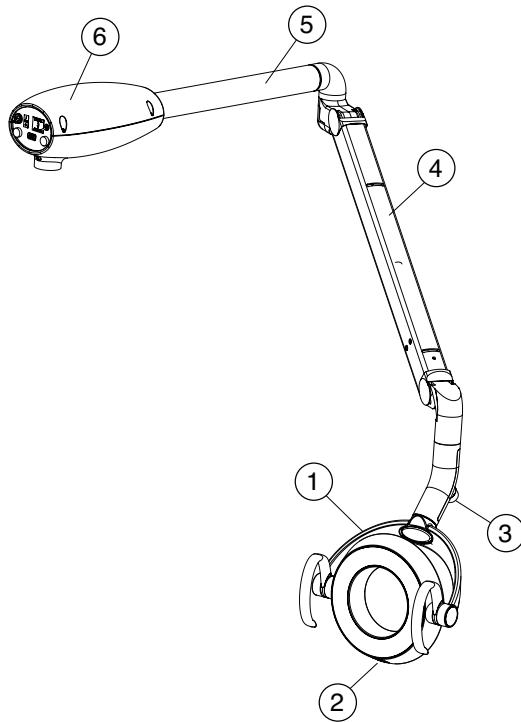
This bracket is on the rear side of the cover

**[7] SWING MOUNT LIGHT (AL-920X)**

Wiring diagram and installation instructions , See the section in Dental Unit installation manual.

## [8] OPERATING INSTRUCTIONS

### 8-1. Major Parts Identification



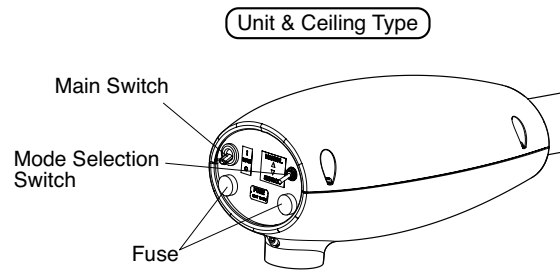
- (1) LED Light Head
- (2) Sensor Switch
- (3) Intensity Control Volume
- (4) Balance Arm
- (5) Swing Arm
- (6) Power Supply Box

### 8-2. Main Switch

Turn on the main switch to the side marked with 'I'.

Power on : 'I' Mark

Power off : 'O' Mark



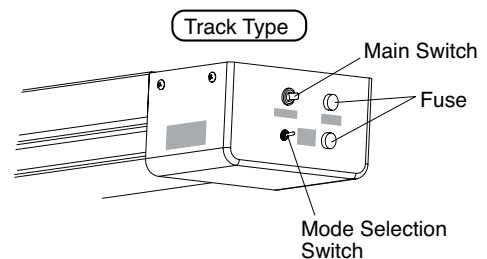
### 8-3. Mode Selection Switch

Switching modes can be changed by this switch.

This switch is located on power supply box.

Sensor : Touch-less ON/OFF and composite mode

Manual : Manual Mode (ON only)



### 8-4. Touch-less Switch

The light can be turned on/off with a touch-less sensor switch. The intensities are regular operation mode and composite mode.

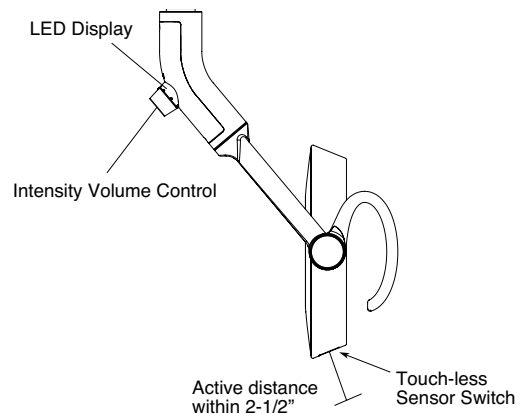
#### 8-4-1. Confirmation of mode selection switch

Make sure that the mode selection switch is in sensor mode.

#### 8-4-2. Turning on/off

The touch-less switch has a sensor. The sensor activates within the distance of 2-1/2" from the surface. Let your hand pass by within 2-1/2" from the touch-less sensor to turn on the light.

Let your hand pass by again to turn off.



### 8-4-3. Switching to the composite mode

During normal treatment mode, while the light is on, place and hold your hand within 2-1/2" from the touch-less sensor for 2 seconds. The light intensity will be automatically reduced to the composite mode which has intensity of 5500 lux.

LED display under yoke blinks green on at composite mode.

To switch back to the normal treatment mode, place your hand by the touch-less sensor 2 seconds again.

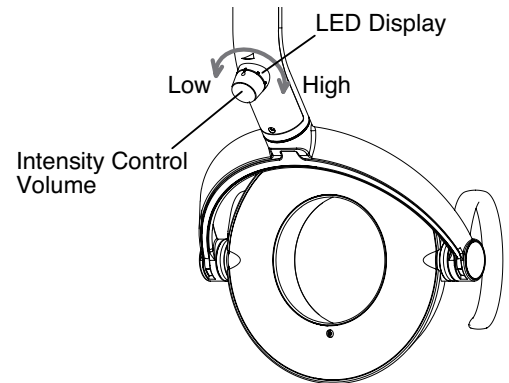
|                | INTENSITY | LED Display |
|----------------|-----------|-------------|
| COMPOSITE Mode | 5500 Lux  | Blink       |

Note: by placing your hand for 2 seconds when the light is off. The light does not lit in the composite mode, but lit in normal treatment mode. Please make sure that the light is on before lighting in composite mode.

### 8-5. Selection of intensity for normal treatment mode

LED display under yoke turns green on at regular operation mode.

By turning intensity control volume, you can adjust intensity steplessly between 4000 - 32000 Lux.



Note: If light intensity is set below 510 FTC and in composite mode, light will Flash briefly when exiting composite mode. This is a normal condition indicating return to standard mode.

## [9] ADJUSTING TENSION of BALANCE ARM

### 9-1. Adjustment of the tension of the balance arm

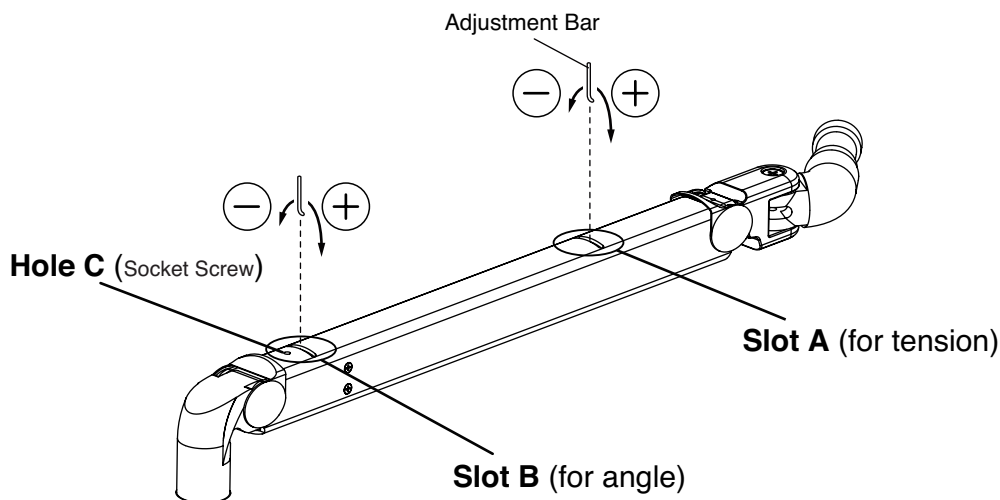
Position the angle of the balance arm so the tension adjustment nut becomes visible just under slot A.

Turn the nut and adjust the tension with the adjustment bar supplied with the light.

Direction of rotation of the nut —————

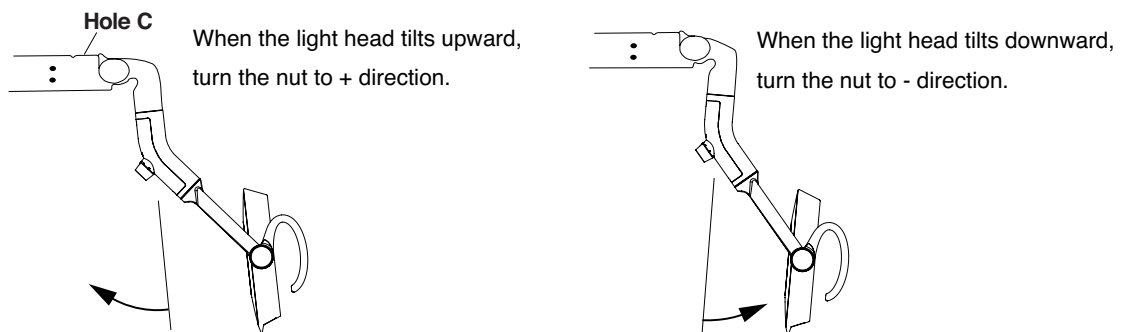
When the light head tends to go up, turn the nut to + direction.

When the light head tends to go down, turn the nut to – direction.



## 9-2 Adjustment of the angle of the light head

- 1) Use a 2mm hex key wrench to loosen socket screw in front of Hole C.
- 2) Position the angle of the balance arm so the head angle adjustment nut becomes visible just under the slot B. Turn the nut and adjust the tension with the adjustment bar supplied with the light.



- 3) After adjustment is done, re-tighten the socket screw.

Note : Unless this socket screw is re-tightened, the angle of the head will be changed during use.

## [10] CLEANING, MAINTENANCE PARTS & DISPOSAL

### 10-1. Cleaning

#### CAUTION

Allow light to cool prior to cleaning.

Use a soft cloth or cotton only to gently clean surfaces. Use of other materials can scratch and damage surfaces. Covers can be cleaned with a soft cloth or cotton moistened with alcohol. The reflector can be cleaned with a soft and dry cloth or cotton with extreme care.

### 10-2. Maintenance Parts

Fuse are maintenance parts.

Period for repair and supplying parts

We will supply parts of the equipment for 10 years, after the manufacturing of this equipment is discontinued.

### 10-3. Lifetime

Provided that the recommended and authorized care and maintenance are correctly performed, the working lifetime of this equipment is 10 years from the date of initial shipment from the manufacturer.

### 10-4. Disposal

This is not an infectious device, but prior to disposal make sure that no parts of the device is infected. Follow the federal, state and local regulations for disposal.

## [11] MAINTENANCE AND INSPECTION

Guide for daily maintenance and inspection (Maintenance and inspection by user)

Management of maintenance and inspection of medical equipment should be implemented by the user (medical inspection). In case the user does not implement such management, it is permitted that such management is outsourced to a qualified entity such as a medical equipment repair company.

For safe use of this product, it is necessary that inspection should be conducted in the specified frequency on the items described below.

| No. | Item                                | Frequency       | Inspection Method and diagnosis  | Influence if inspection is not conducted   | Maintenance required in case of nonconformity                            |
|-----|-------------------------------------|-----------------|--|--|--|
| 1   | Appearance of Lens Cover            | Before start    | Check deformation, scratches by eyes   | Deterioration of optical performance   | Change a lens cover.   |
| 2   | Light switch                        | Before start    | Set Sensor/Manual switch to Manual. Confirms the light turns on.   | Light doesn't function.  | Replace a light bulb.  |
| 3   | Touchless sensor                    | Before start    | Set Sensor/Manual switch to Sensor. Confirms the light turns on.   | Light doesn't function.  | Clean the sensor surface.  |
| 4   | Intensity switch                    | Before start    | Change intensity.  | It may cause the difficulty at dental practice.  | Turn off the light. Call customer service.                               |
| 5   | Functionality of Balance Arm        | Before start    | Swing the balance arm up/down. Swing the balance arm right/left. Make sure the balance arm stops and holds its position. | Light head doesn't stay at the desired position.   | Adjust the tension of the balance arm. Follow instructions on page 13.   |
| 6   | Vertical rotation of the Light head | Before start    | Rotate the light head up/down. Make sure the light head stops and holds its position.                                    | Light head doesn't stay at the desired position.   | Adjust the tension of vertical rotation. Follow instructions on page 14. |
| 7   | Light head angle                    | Before start    | Confirms the light head is vertically aligned.   | Light head doesn't stay at the desired position.   | Adjust the angle of the light head.                                      |
| 8   | Light head rotation                 | Before start    | Rotate the light head right/left. Make sure the light rotate 160° to each direction.                                     | Light head rotates freely. This may cause the snapping of a wire.  | Call customer service.   |
| 9   | Care exterior                       | Before start    | Chemical and dirt on the product exterior must be cleaned.   | Discoloration and deterioration to the exterior, and corrosion and rusting to metallic components may arise. | Executes wiping in accordance with "Cleaning Instructions"               |
| 10  | Other 1                             | Once every week | Make sure that no abnormal noise occurs when the product is operated.  | Light may not function right.  | Turn off the light. Call customer service.                               |
| 11  | Other 2                             |                 | If the light has not been used for a long time, make sure the light functions correctly and safely.                      | /  | If the light malfunctions, call customer service.                        |

## NOTE



**BELMONT EQUIPMENT, Division of Takara Belmont USA, Inc.**

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